DRAFT – FOR DISCUSSION

White Paper

The Possible Role of Microbially Induced (Internal) Corrosion on STI-P3 Tanks

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Recent reports of catastrophic releases such as the Miles City, Montana catastrophic gasoline release during the winter of 2011, have caused concern that first generation STI-P3 tanks may be failing due to internal corrosion. Microbially induced corrosion (MIC) of steel components is well documented in the literature and recent efforts by the USEPA Office of Underground Storage Tanks (OUST) and the Office of Research and Development (ORD) have highlighted tank system compatibility concerns created by the widespread use of ethanol blended fuels ("biofuels").

Miles City, Montana Release:

A recent catastrophic release (>12,000 gallons) in Miles City, Montana indicates the importance of evaluating the possible role of MIC in the premature failure of first generation STI-P3 tanks. Observations from this case include the following:

- STI-P3 tank installed in 1987 (first generation of compliant USTs)
- Erratic cathodic protection reading from the UST system over several years
- Periodic failure indications of the SIR system used by the owner/operator
- Post-excavation inspection of the interior tank surface showed significant corrosion along the interior bottom area of the tank indicating the presence of water in the tank contributed to continued corrosion
- Heavy accumulation of tank scale in the bottom of the tank, 3-4 inches in depth
- Post-excavation inspection of the exterior tank surface showed no significant corrosion and one location where internal corrosion perforated the outer tank coating

Conclusions from observations:

- Collection of water in the tank was a factor contributing to tank failure
- MIC was accelerated by the constant presence of water
- The presence of ethanol blended fuel in the failed tank may have accelerated MIC

Further Study Verification:

- Conduct a complete review of existing literature related to MIC in USTs
- Conduct a national survey of catastrophic releases from STI-P3 tanks over the last 5 years
- Evaluate statistical trends of data for correlation of tank failures with age of tanks, water accumulation, anomalous leak detection readings, and biofuel storage

- Evaluate other alternatives that may be contributing factors to tank failure: compliance violations, human error, increased maintenance needs due to water accumulation, lack of state inspection oversight, etc.

Possible Study Outcomes:

- No change in existing tank policy
- Recommend that states increase owner/operator education to conduct better tank maintenance (e.g., understanding anomalous cathodic protection readings, better water management, periodic internal inspections)
- Recommend that states conduct annual inspections of all facilities containing STI-P3 tanks installed between 1985 and 1995
- Recommend that facilities with tanks having significant internal corrosion remove tanks that do not meet a minimum tank wall bottom thickness standard

References:

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